

LISTING OF CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the Application.

Original claims 1-17 (Cancelled)

What is claimed is:

18. (New) A baseband processor for iteratively processing a plurality sequences of received baseband digital signals, the baseband processor subsystem comprising:

at least two soft decision decoders are serially coupled in a circular circuit wherein each decoder processes soft decision from the preceding decoder output data in an iterative mode;

at least one memory module that is electrically coupled to an output of a corresponding soft decision decoder, wherein the output of the memory module associated with the last soft decision decoder is fed back as an input to the first soft decision decoder, wherein the output of the memory module associated with the first soft decision decoder is fed as an input to the second soft decision decoder, wherein the last soft decision decoder receives output of the memory module associated with the preceding soft decision decoder.

19. (New) The baseband processor subsystem according to claim 18, wherein each decoder processes at least one baseband source signal input and an extrinsic information input coupled from the preceding memory module, wherein each decoder performs the maximum a posteriori decoding algorithm and stores the soft decision into its corresponding memory module.

20. (New) The baseband processor subsystem according to claim 18, wherein each soft decision decoder uses a maximum a posteriori (MAP) probability algorithm, and/or a logarithm approximation algorithm.

21. (New) The baseband processor subsystem according to claim 18, wherein each soft decision decoder implements concatenated convolutional codes.

22. (New) The baseband processor subsystem according to claim 18 further said to be implemented in an ASIC (application-specific-integrated-circuit) of an SoC (system-on-chip) device, or in an VLSI (very large-scale integrated circuits) device for wireless communication applications.

23. (New) A method of iteratively decoding a plurality of sequences of received baseband signals, the method comprising:

processing systematic information data and extrinsic information data using the maximum a posteriori (MAP) probability algorithm, and/or logarithm approximation algorithm;

generating soft decision based on the maximum a posteriori (MAP) probability algorithm, and/or logarithm approximation algorithm;

weighting and storing soft decision information into the corresponding memory module;

performing, for a predetermined number of times, iterative decoding from the first to the last of multiple decoders, wherein an output from the last soft decision decoder is fed back as an input to the first soft decision decoder, then from the first to the second decoders, and propagate to the last decoder in a circular circuit.

24. (New) The method according to claim 23, wherein the soft-in soft-out (SISO) maximum a posteriori (MAP) probability algorithm and logarithm approximation algorithm calculates the alpha function probability $A(k)$ of each state transition in forward recursion and the beta function probability $B(k)$ in backward recursion.

25. (New) The method according to claim 23 further said to be implemented in software coded SISO maximum a posteriori (MAP) probability algorithm and/or logarithm approximation algorithm using any available DSP (digital-signal-processor) device.